

# **Point and Shoot Application Profile Test Specification**

Version 1.0

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Infrared Data Association Draft Material

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## 1 DOCUMENT STATUS

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## 2 INTRODUCTION

This document describes the tests that an approved IrDA Test Lab must perform on a device to ensure compliance with the Point and Shoot Profile described in [PNS]. For a device to become a candidate for IrReady Point and Shoot Profile certification, it must pass all of the tests as specified by this document.

### 2.1 Acronyms and Abbreviations

{PDU = Protocol Data Unit}  
{DUT = Device Under Test}  
{bps = Bits Per Second}

### 2.2 References

[Revise as necessary]

[IrLAP]	Serial Infrared Link Access Protocol, IrLAP, Version 1.1, Infrared Data Association
[IrLMP]	Link Management Protocol, IrLMP, Version 1.1, Infrared Data Association
[IrPHY]	Serial Infrared Physical Layer Link Specification, IrPHY, Version 1.3, Infrared Data Association
[PHYTEST]	IrReady 2000 and IrDA Reference Device Physical Test Guideline, Version 0.2, Infrared Data Association
[TINYTP]	Tiny TP: A Flow Control Mechanism for use with IrLMP, Version 1.1, Infrared Data Association
[LITE]	Minimal IrDA Protocol Implementation, IrDA Lite, Version 1.0, Infrared Data Association
[OBEX]	IrDA Object Exchange Protocol, IrOBEX, Version 1.2, Infrared Data Association
[IrMC]	IrMC (Ir Mobile Communications) Specification, Version 1.1, February 1999, Infrared Data Association
[VCARD]	VCard – The Electronic Business Card Exchange Format, Version 2.1, September 1996, The Internet Mail Consortium
[VCAL]	VCalendar – The Electronic Calendaring and Scheduling Exchange Format, Version 1.0, September 1996, The Internet Mail Consortium
[JETSEND]	JetSend Protocol on IrDA Application Note, , Version 1.1, November 1999, Infrared Data Association
[PNS]	IrDA Point and Shoot Profile, Version 1.0, January 2000, Infrared Data Association
[INTEROP]	Interoperability Test Plan and Process, Version 1.2, September 1998, Infrared Data Association

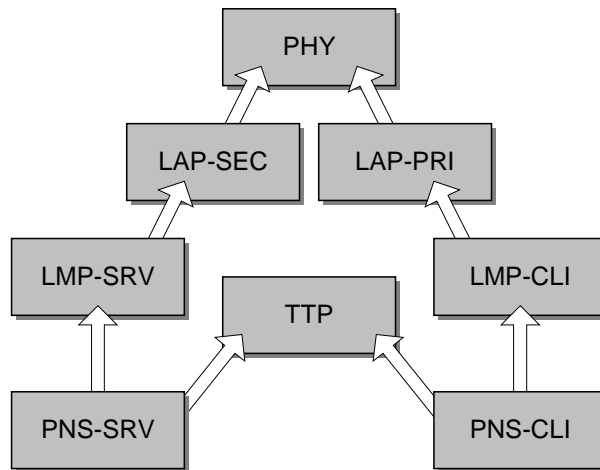
### 3 TEST PROFILES

[PNS] defines the Point and Shoot “usage model” and the Point and Shoot “application profile”. This test specification defines a number of “test profiles”. For a candidate device to be awarded IrReady 2000 Point and Shoot compliance, an IrReady Test Lab must demonstrate that the candidate device complies with all applicable test profiles.

For example, [PNS] defines an application profile with two independent modes: Push Client and Push Server. They are independent because a compliant device may be a Push Client, a Push Server, or both. These two modes correspond to separate Test profiles (PNS-SRV and PNS-CLI).

Furthermore, Push Client and Push Server behavior depend on typical infrared implementation layers such as IrLMP, IrLAP, and physical. For organizational purposes, this document defines a hierarchy of Test Profiles for these layers. It may be convenient for other profiles’ test specifications to refer to the test profiles defined here.

The following diagram illustrates the dependencies of test profiles. For example, The PNS-CLI (Point and Shoot Push Client) profile depends on the TTP and LMP-CLI test profiles, which in turn depend on LAP-PRI and PHY test profiles. These test profiles are defined in more detail later in this chapter.



It is important to note that a demonstration of test profile compliance need not be exhaustive: tests will cover only a subset of the possible behaviors indicated by the protocol specifications (such as [IrLAP], [IrLMP], and the like). However, results from these tests are representative enough for an IrDA-approved test lab to determine whether the device is IrReady 2000 compliant.

The test profiles required by the Point and Shoot application profile are defined in the sections below.

#### 3.1 Physical Layer Test Profile (PHY)

A device that can demonstrate a minimal level of compliance with [IrPHY] complies with this test profile. It is understood that not *all* physical characteristics need be tested, but test results should provide a representative sample to demonstrate interoperability. The tests and report formats described in the [PHYTEST] document are sufficient to demonstrate compliance with this PHY test profile.

#### 3.2 IrLAP Secondary Test Profile (LAP-SEC)

A device that can demonstrate a minimal level of interoperability with IrLAP primary devices complies with this LAP-SEC test profile. Compliance with LAP-PRI also implies compliance with the PHY test profile.

Candidates must be able to demonstrate the following procedures:

- 1) Respond to discoveries from a primary device. The candidate's responses must include appropriate hint bits and a nickname. Responses must be formatted correctly and comply with all limitations and requirements as specified in [IrLAP].
- 2) Respond to IrLAP connection requests from a primary device. The candidate must respond with properly formatted connection parameters and honor the primary's requested connection settings.
- 3) Exchange data reliably during a connection. The candidate must discard improperly formatted data. Nr and Ns counts must be handled as specified by [IrLAP].

LAP-SEC test reports must include data captured from the session that shows timing, packet framing (XBOF, FCS, etc) and packet payload data from all devices involved in the demonstration. Any publicly available IrDA device or test tool may be used as the secondary device, as long as all of the procedures above are demonstrated.

### **3.3 IrLAP Primary Test Profile (LAP-PRI)**

A device that can demonstrate a minimal level of interoperability with IrLAP secondary devices complies with this LAP-PRI test profile. Compliance with LAP-PRI also implies compliance with the PHY test profile.

Candidates must demonstrate the following procedures:

- 1) Initiate discoveries periodically or when a connection is requested by the user. The candidate's discovery frames must be formatted correctly and comply with all limitations and requirements as specified in [IrLAP].
- 2) Initiate IrLAP connections to discovered secondary devices. The candidate must transmit a properly formatted connection request, and honor the connection settings requested by the secondary.
- 3) Exchange data reliably during a connection. The candidate must discard improperly formatted data. Nr and Ns counts must be handled as specified by [IrLAP].
- 4) Close the IrLAP connection properly using DISC frames when a session is complete.

LAP-PRI test reports must include data captured from the session that shows timing, packet framing (XBOF, FCS, etc) and packet payload data from all devices involved in the demonstration. Any publicly available IrDA device or test tool may be used as the secondary device, as long as all of the procedures above are demonstrated.

### **3.4 IrLMP Server Test Profile (LMP-SRV)**

To comply with the LMP-SRV test profile, a device must demonstrate a minimum level of interoperability with remote IrLMP and IAS client implementations. Compliance with LMP-SRV also implies compliance with the LAP-SEC test profile. (Compliance with the LAP-PRI test profile is not required for LMP-SRV test profile compliance but may be required by other higher-level test profiles.)

Candidates must demonstrate the following procedures:

- 1) Respond successfully to a request for an IAS connection according to the formats and procedures in [IrLMP].

- 2) Respond to requests for IAS attributes using the GetValueByClass query as specified in [IrLMP]. Specifically, the “Device” class, “DeviceName” attribute must be present. At least one other service must also be present, with an attribute that indicates its LSAP.
- 3) Respond successfully to a connection request for any advertised service.
- 4) Allow higher-layer data traffic to flow in both directions between the IrLMP client and the IrLMP server.

LMP-SRV test reports must include data captured from the session that shows data transmissions from both the client and server devices. Any publicly available IrDA device or test tool may be used as the IrLMP client, as long as all of the procedures above are demonstrated.

### **3.5 IrLMP Client Test Profile (LMP-CLI)**

To comply with the LMP-CLI test profile, a device must demonstrate a minimum level of interoperability with remote IrLMP and IAS server implementations. Compliance with LMP-CLI also implies compliance with the LAP-PRI test profile, because Point and Shoot clients are generally responsible for opening the IrLAP connection.

Candidates must demonstrate the following procedures:

- 1) Request an IAS connection according to the formats and procedures in [IrLMP].
- 2) Generate at least one IAS GetValueByClass query to the IAS server. A request for the appropriate LSAP of a remote service must be made.
- 3) Initiate an IrLMP connection request using the LSAP provided by the server.
- 4) Allow higher-layer data traffic to flow in both directions between the IrLMP client and the IrLMP server.

LMP-CLI test reports must include data captured from the session that shows data transmissions from both the client and server devices. Any publicly available IrDA device or test tool may be used as the IrLMP server, as long as all of the procedures above are demonstrated.

### **3.6 Tiny TP Test Profile (TTP)**

To comply with the TTP test profile, a device must demonstrate a minimum level of interoperability with remote Tiny TP implementations. Compliance with either LMP-SRV or LMP-CLI is required for compliance with the TTP test profile.

Candidates must demonstrate the following procedures:

- 1) Provide credits to a remote Tiny TP entity as defined by [TTP]. Credits must be advanced in the connection packet or shortly thereafter.
- 2) Prevent data from being transmitted when credits have been consumed.
- 3) Allow data to be transmitted when credits have been granted.
- 4) Grant an appropriate number of credits to the remote device to allow it to transmit data. Credits must not be advanced beyond the Tiny TP limitation of 127 credits, nor should credits be withheld for noticeably long periods of time.

TTP test reports must include data captured from the session that shows data transmissions from both the client and server devices. Any publicly available IrDA device or test tool may be used as the remote Tiny TP entity, as long as all of the procedures above are demonstrated.

### **3.7 Point and Shoot Push Server Test Profile (PNS-SRV)**

To comply with the Point and Shoot Push Server test profile, a device must demonstrate a minimum level of interoperability with OBEX client entities. Compliance with TTP and LMP-SRV test profiles is required for compliance with the PNS-SRV test profile.

Candidates must demonstrate the following procedures:

- 1) Respond to an “OBEX” class, “IrDA:TinyTP:LsapSel” attribute IAS query with an LSAP that identifies the OBEX service.
- 2) Respond to “Connect”, “Put”, and “Disconnect” operations correctly as specified by [OBEX].
- 3) During a “Put”, accept data packets of any size up to the maximum specified in the Push Server’s “Connect” packet.
- 4) Accept “Abort” or link loss at any point during a “Put” to terminate a “Put”.
- 5) Accept multiple “Put” operations during the same OBEX connection.
- 6) Accept any of the following headers during a Put operation: Count, Name, Type, Length, Time, Description, HTTP, Body, and End of Body. Receipt of any of these headers should not cause a Put to fail unless they specify an object that the Push Server may legitimately reject. Note that this demonstration need not show that all received header is used, except for Body and End of Body headers.
- 7) Appropriately use objects received during a Put operation as determined by the Device Class of the candidate device. The appropriate use of received objects is detailed in section 4.1.4 of [PNS].

PNS-SRV test reports must include data captured from the session that shows data transmissions from both the client and server devices. Any publicly available IrDA device or test tool may be used as the Push Client, as long as all of the procedures above are demonstrated.

### **3.8 Point and Shoot: Push Client Test Profile (PNS-CLI)**

To comply with the Point and Shoot Push Client test profile, a device must demonstrate a minimum level of interoperability with OBEX server entities. Compliance with TTP and LMP-CLI test profiles is required for compliance with the PNS-CLI test profile.

Candidates must demonstrate the following procedures:

- 1) Upon the user’s request to push an object or objects, establish an IrLAP/IrLMP/Tiny TP/OBEX transport connection.
- 2) Send the “Connect” operation and one or more “Put” operations using the formats and procedures specified by [OBEX].
- 3) Accept link loss at any point before, during, or after a “Put” operation.
- 4) Generate each type of data required for the Push Client’s device class, as specified in section 4.1.4 of [PNS].

PNS-SRV test reports must include data captured from the session that shows data transmissions from both the client and server devices. Any publicly available IrDA device or test tool may be used as the Push Client, as long as all of the procedures above are demonstrated.